## REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated June 18, 2003. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

### Status of the Claims

Claims 2-6, 8 and 10-13 are under consideration in this application. Claims 1, 7, 9 are being canceled without prejudice or disclaimer. Claims 2-6 and 8 are being amended, as set forth in the above marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim applicants' invention. A new claim 13 is being added to recite other embodiments described in the specification.

### Additional Amendments

The claims are being amended to correct formal errors and/or to better disclose or describe the features of the present invention as claimed. All the amendments to the claims are supported by the specification. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

### Formality Rejections

Claims 5-9 were rejected under 35 U.S.C. 112, second paragraph, as being vague and indefinite. As indicated, the claims have been amended as required by the Examiner. Accordingly, the withdrawal of the outstanding informality rejection is in order, and is therefore respectfully solicited.

### Allowable Subject Matter

Claims 10-12 were allowed, and claim 2 would be allowed if it is rewritten in an independent form to include all of the limitations of the base and the intervening claims. As claim 2 is being rewritten in an independent form to include all of the limitations of the base and the intervening claims, it is in condition for allowance.

Prior Art Rejections

Claims 1, 3 and 4 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,320,547 to Fathy et al. (hereinafter "Fathy"). The prior art references of Greenman et al. (5,832,598) and Tserng et al. (5,521,406) were cited as being pertinent to the present application. This rejection has been carefully considered, but is most respectfully traversed.

As claim 1 is being cancelled and claim 4 depends from claim 3, the rejection against claims 1 and 4 thus becomes moot.

The high frequency circuit module of the invention (Figs. 1-2), as now recited in claim 3, comprises: a multilayer dielectric substrate having a first and a second dielectric substrates 2-1, 2-3 each of which has RF circuit parts mounted on one side thereof, and at least one third dielectric substrate 2-2 provided between the first and second dielectric substrates 21-, 2-3, and a transmission line 16 constructed by a via having a coaxial structure connecting said RF circuit parts of the first and second dielectric substrates 2-1, 2-3 in a direction perpendicular to the face of said multilayer dielectric substrate. The via having a coaxial structure is formed by a center conductor 19 and a cylindrical conductor 18 surrounding said center conductor 19 and connected to a plurality of grounding conductive layers 9, 11 provided in said multilayer dielectric substrate. In particular, <u>each of said grounding conductive layers 9, 11 is connected to both sides of the cylindrical conductor 18 and has a circular radial gap ***g*** (the attached reference drawing Fig. 2B) from an inner land connected to said center conductor 19, and said circular radial gap ***g*** is smaller than ¼ of a wavelength λ of a high frequency signal to be transmitted through the transmission line (g < 1/4 λ)</u>. "*A land less pattern of the metallic layers 9 to 11* [i.e., g or g'] *is designed to be 1/4 of the wavelength or less* (page 13, lines11-13)" such that <u>***g*** or ***g'***< ¼ λ</u>. "*A land less pattern of the metallic layer 10 is designed to be the outer diameter size*[of the coaxial structure] (page 13, lines 13-15)" such that ***g'*** is preferably equal to the outer diameter of the coaxial structure (***g'*** ~ ***G***).

The microstrip transmission line of a millimeter wave circuit part as recited in claim 3 is formed by a land pattern of a surface metallic layer 17 on first dielectric substrate layer 2-1 and a metallic layer (or grounding layer) 9 provided between a first and second dielectric substrate layer 2-1, 2-3. As shown in attached noted Figs. 2A and 2B, the input/output portions of the coaxial structure is formed by a center conductor 19 and a cylindrical conductor 18 surrounding said center conductor 19 has a special construction. Specifically, the specific grounding conductive layers 9 or 11 connected to both sides of the cylindrical conductor 18 have circular

radial gaps ***g*** <u>smaller</u> than ¼ of the wavelength of high frequency signal to be transmitted through the transmission line (or via) between an inner land connected to the center conductor 19 and said grounding conductive layers 9 or 11. The ring gap ***g*** is formed at ends of the coaxial structure to provide a band pass filter for the to be transmitted high frequency signal.

The radius ***G*** of the cylindrical conductor 18 is specified to obtain a predetermined characteristic impedance. With the metallic planes (or an opposite electrode of the microstrip line) extending over the cylindrical conductor 18 toward the center conductor 19 to form the input/output portion of the coaxial line, the microstrip line has only gaps smaller than ¼ wavelength of the high frequency signal to be transmitted such that a phase rotation by an inductance component at the input/output portions of via of coaxial structure is small. Accordingly, the reflection loss and the pass loss are reduced.

Claim 4 now recites that a high frequency circuit part 1 provided on surface of the second dielectric substrate 2-2(Fig. 1,2-4) is an antenna. Claim 5 now recites a microstrip transmission line of millimeter wave circuit part formed by the first dielectric substrate 2-1, a pattern of a metallic layer 17 on one surface of the first dielectric substrate 2-1 and a metallic layer 9 (Fig. 1), and a transmission line for transmitting low frequency signal and power formed by another metallic layer (10) provided in the multilayer dielectric substrates 2-2, 2-3.

Claim 6 now recites (Fig. 7) the second dielectric substrate 2-3, wherein, the lowest layer in Fig. 7 on which antenna pattern 1 is formed, is a both-sided, two-layered dielectric substrate being larger than the dielectric substrate 2, and a support plate 3 is formed where the dielectric substrate 2 is not stacked another surface of the second dielectric substrate opposite to the surface provided with the antenna pattern 1. Claim 8 now recites a hermetic cap 4 (Figs. 4, 7, 8) mounted on a sealing pattern (25 in Fig. 5) formed on the surface of first dielectric substrate 2-1 to cover the high frequency circuit parts (5-1, 5-2 21, ~24, etc.).

Applicants respectfully contend that neither Fathy nor any other cited reference teaches or suggests a high frequency circuit module having a transmission line 16 constructed by a via having a coaxial structure formed by a center conductor 19 and a cylindrical conductor 18 surrounding said center conductor 19 with <u>circular radial gap ***g*** therebetween which is **smaller** than ¼ of a wavelength λ of a high frequency signal to be transmitted through the transmission line ($g < \frac{1}{4}\lambda$)</u>.

In contrast, the gap between a center conductor and a cylindrical conductor in Fathy is the **same** as the inner radius of the coaxial structure ***(g=G)***, rather than **smaller than** ¼ of a wavelength λ of a high frequency signal to be transmitted through the transmission line ***(g < ¼***

$\lambda$). Without any metallic planes extending over the cylindrical conductor toward the center conductor 708 or 820 to form the input/output portion of the coaxial line and provide gaps thereof, (1) the inner radius of the outer conductor 703 at input/output portions of via of the coaxial structure is the **same** size as the inner radius of the coaxial structure 710 (Fig. 7A), and (2) the inner radius of the outer conductor 814 at input/output portions of via of the coaxial structure is the **same** size as the inner radius of the coaxial structure 822 (Fig. 8). The microstrip line in Figs. 7A and 8 discontinues transmission in which magnetic distribution generated by a current through the microstrip line is diffused. Accordingly, an inductance value of the microstrip line is increased, and the reflection loss and pass loss are increased.

As such, the present invention as now claimed in independent claim 3 is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art reference upon which the rejections in the Office Action rely, Applicant respectfully contends that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

Respectfully submitted,

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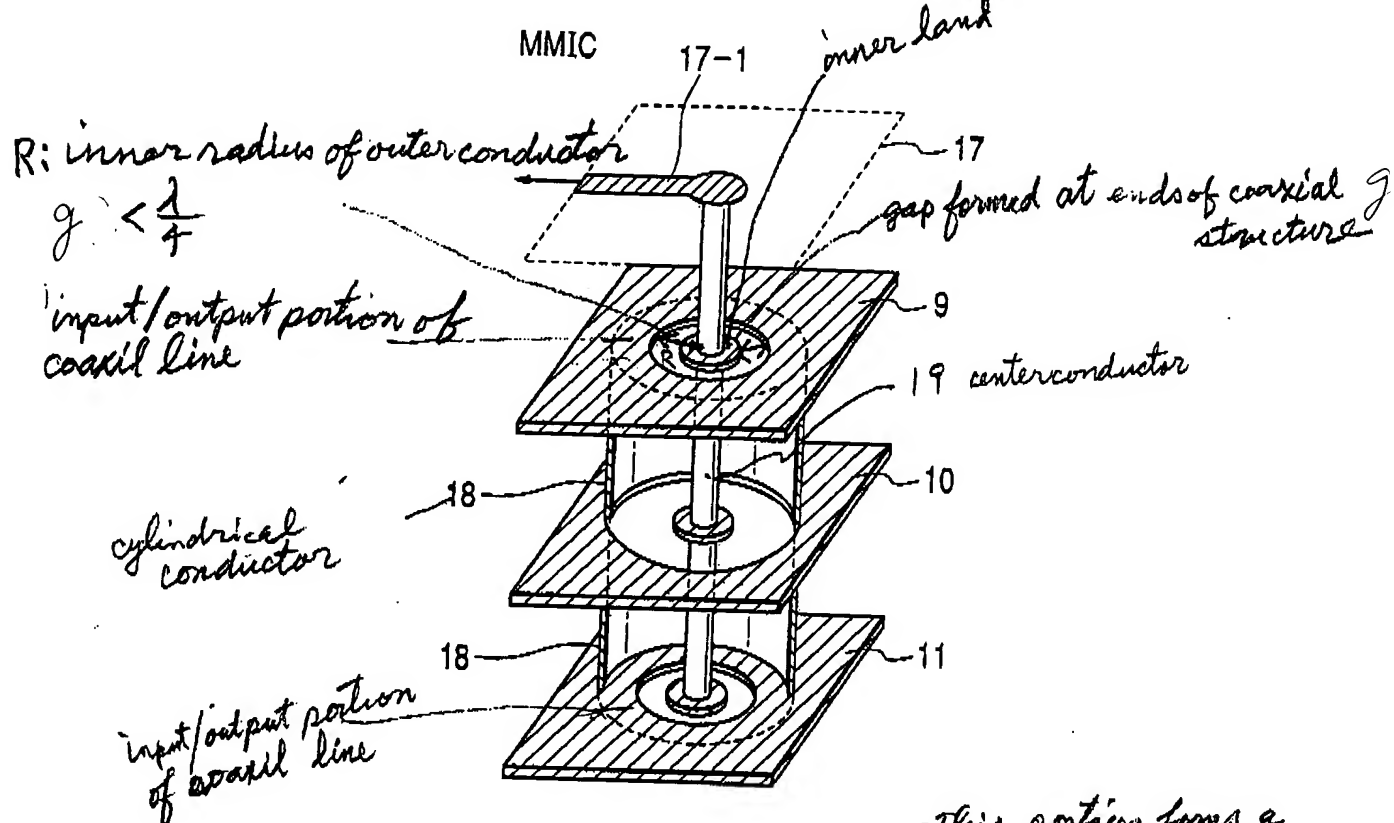
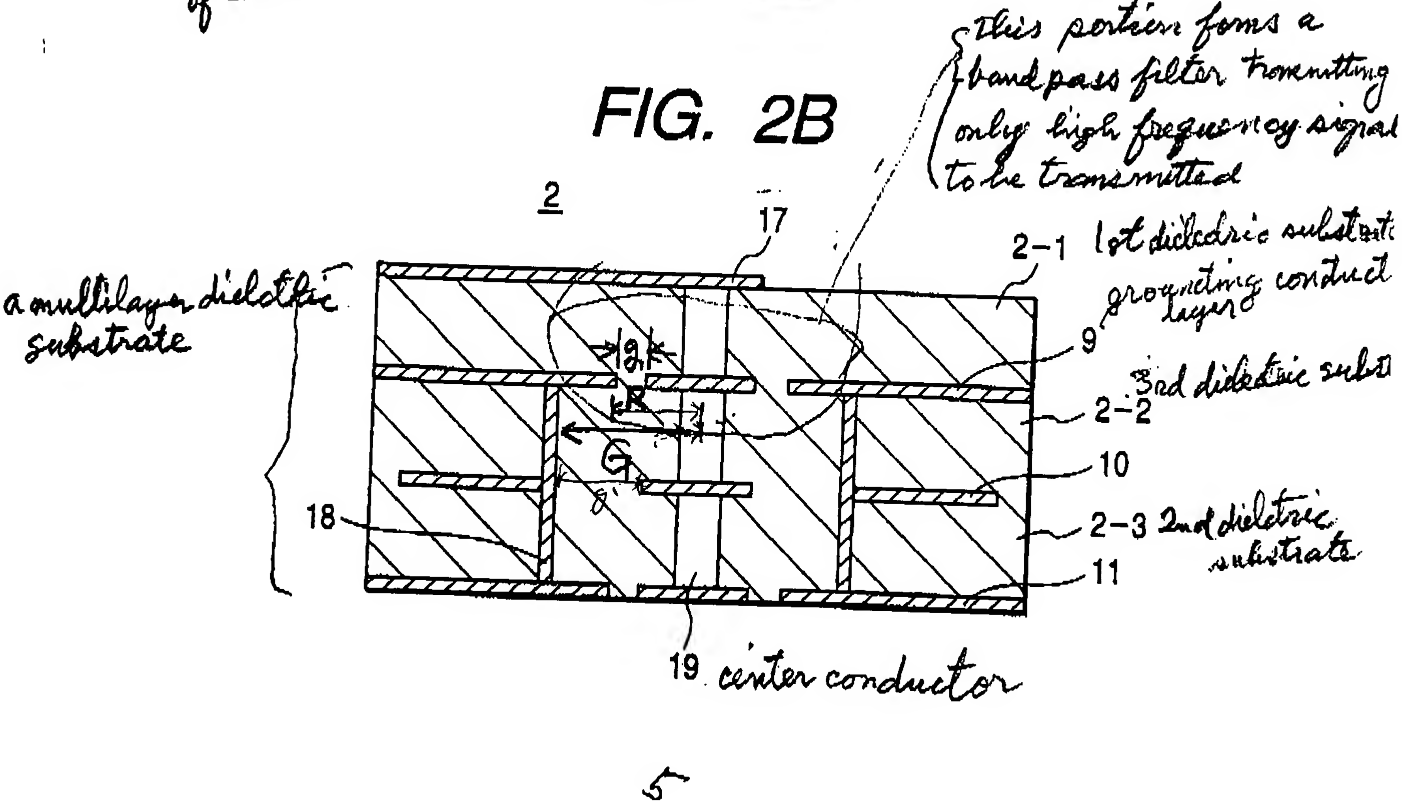
# FIG. 2A


MMIC
17-1
inner land
R: inner radius of outer conductor
17
g < λ/4
gap formed at ends of coaxial structure g
input/output portion of coaxil line
9
19 centerconductor
18
10
cylindrical conductor
18
11
input/output portion of coaxil line

# FIG. 2B


This portion forms a bandpass filter transmitting only high frequency signal to be transmitted
2
17
2-1 1st dielectric substrate
grounding conductor layers
a multilayer dielectric substrate
g
R
9
G
2-2 3rd dielectric substrate
10
18
2-3 2nd dielectric substrate
11
19 center conductor